



SEQUENCE LISTING

<110> CHELLY et al.

<120> GENE CALLED OLIGOPHRENIN1 . . .

<130> P06780US0/BAS

<140> US 09/581,422

<141> 2001-11-20

<150> PCT/EP98/08557

<151> 1998-12-14

<150> EP 97 403 050.4

<151> 1997-12-15

<160> 27

<170> PatentIn version 3.1

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| ggatatatta aaagggggac ttttttggtt tatttcccaa aatgggttga gttagattct | 840 |
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| aaaataattt cagtggatat taaactgggc ctttgaacat gttgacagaa attgaggtct | 840 |
| ttagtgtttt tagccaaatt atccatttgt taatctttaa tttgtggagt agttttactt | 900 |
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| tttttttttt ttggtgaggg gttaggggaa tgttctgttt tgggactact ggttacctgg | 960 |
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| cccctgatag | ctaaaattcc | cttggaacgc | aggcagggaa | tactgaaaac | aaaaaaaaaa | 420 |
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ccacccccgc ctccatgggt cccaaagtta ctgttctgta aattgcctat tgtttttctt      60
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actccagggc agagagggac cctagatcac aagactccat tctctcagtt gaattttctg      180
ctttatactt accatTTTTT tccccctcag gccaggaacc atcactctgc aggccctttc      240
agaagctaac agaaggctat ggatggaagc catggatggg aaagaacctg taagttacct      300
gacactgggg caaacctccc cagcatatgc cagtgtatga gtgccctcta gtggtatcag      360
tgggtctcan acaattaaat ggtaatggat tgtttagtct cagttttaga gctgtaagga      420
attgtttcca catctcttag caggtaaggc aactggagtt ccagaaaggt tgagggactt      480
ttctgagacc accc                                         494
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<210> 13

<211> 378

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<213> Homo sapiens

<220>

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<222> (212)..(245)

<223>

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<222> (166)..(189)

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<220>

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<222> (259)..(278)

<223>

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ggcatgagcc accacgcctg gcctgttcaa gtattttcta gcaatcttgg caaagcaatt      60
atgttttagcc cacttggtta tctttttaac atcctggagt ttctaatacat ttttaatgcc      120
tatctgggga aagatattta atattatggt ctctgttttc ctatattgat tgacaatagc      180
catggatctt tctgtttatc ttcttttgta gatctaccac agccctataa caaacagca      240
agaaagtgag tcacttaagt ttttgggtcta ctagcattat aaactgccag ctgtccgatt      300
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catagtaaat accatcatta atgatgtgta ctactaacgc aagtctgaat atggatgcct 360
 ttgtgtgaaa taaaattc 378

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 <222> (172)..(234)
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 <222> (250)..(269)
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 aggtgacacc tggtgcagca ggatctaact cttttccttt gcttgaaaca gtggagctaa 180
 atgaagtggg cttcaagttt gtcaggaagt gcatcaatat tattgagacc aaaggtaaga 240
 tctgaaccat agtcttggca ttgtctgaat ctcgtcactc tgattttatc ctgggcaatt 300
 tctctgaagt agcgtttttag gaatgaagac tgtttataaa gcttgtgtag tagatgcaag 360
 ctagaaaatt tcagaaaatt ctaaactagt ggt 393

<210> 15
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agattaatga gggtttggtgta cactccaaat gaaaggatgg ataatttgga gagatgctgt      60
aggactattc ccctgttaca gggaaggctg gagaacttgg agtatgtagt gtgacccctt      120
cctatctgaa ttgactctag tgtaccaagg ggagatgaca acttttagcta tacaagtga      180
attaacctga ttttttcctc cactagggat caagacagaa gggttgtacc gcactgtggg      240
cagcaatatt caggttcaga agctgctgaa tgcctttttt ggtaacaatt tcactttgat      300
aattcttatt gggagtactt tatgtgttac aaagaaatgt gactggaaga gaaaggagac      360
actgctaaaa tgtggtagaa tagttgaaaa aagtattttc taaagtaaaa catacacata      420
cttgcccacc ctgggc      436
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<223> n=(a or c or t or g)

<220>
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<222> (270)..(354)
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<220>
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<222> (221)..(244)
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<220>
<221> oligonucleotide
<222> (363)..(382)
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accccagtna tntgatgaat ctaagaagag tngatnttgt ttgttcagtt ttttcttggt      60
gtgtgaattg gatagattac tttnttattt cttatatggc agaccagaat gcagtcatgt      120
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| | |
|---|-----|
| ttttgaaata tcaaagattt gcttcttcta aagttttgat ntcttaaaaa ctacttaggg | 180 |
| tnatatactt tgtttttctt ttaaaagagg gaaaatgtaa gatttttttg atgattaact | 240 |
| tttgtttttt gtttactttt ctcaaataga tcctaaatgc ccaggagatg ttgattttca | 300 |
| taatagtgc tgggacatta agacaatcac cagctccttg aaattctacc tcagggtatgc | 360 |
| ctgatttgaa ttgggagttt gcttttcata gctggtgaaa tttctctggg tgttgagcgg | 420 |
| agttaacgtg gtctcagttc caggagtttg gatacaattg cttaanaaaa aacatgtgaa | 480 |
| gaggatttct ggccangaat gtgcaaanac tgttttttta atctgagagt ttaagcaaga | 540 |
| gaagcat | 547 |

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 <222> (353)..(413)
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 <222> (305)..(324)
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 <222> (438)..(457)
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| ggacaattgc aaaagcactt cggaaattct aaggatctat caaatcgtaa gggattcatg | 60 |
| gtagcattca gcatgggtcc cctctggaat ttgacaggac tggtttgatg ctctttttac | 120 |
| ttntgggagc tagttggaga ccttgctaga gggctcagcc catgcttttg caggcttttt | 180 |
| gttgaattac tagcaacttg gattccctga cgaagcttca ggtgaagaga aaaatgtata | 240 |
| taatcccact aagctgtagg gctcaggaac ttcagccttg ctgtccccag aactaagaat | 300 |
| ccaataccca gctgctttnt tcccaaagca actgacaatt ttcattcatt tcaggaatct | 360 |
| ttctgaacct gtcatgacct atagacttca caaagagctg gtctctgctg ccagtaagta | 420 |

| | |
|---|-----|
| tttatgttac taattaactg tgtgtgccta gtttcttaat gtttactgca ataagcctag | 480 |
| aaaattgttt gaggggaagt gattgagggc acagaaacct aaaacacata cacaattat | 540 |
| gcacaactgc caaatgaaag tattcttgct tgctgtctaa ctcaanaatt ctattat | 600 |
| t | 601 |

<210> 18
 <211> 387
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 <213> Homo sapiens

<220>
 <221> exon 18
 <222> (80)..(185)
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<220>
 <221> oligonucleotide
 <222> (25)..(44)
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<220>
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 <222> (218)..(237)
 <223>

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|--|-----|
| <400> 18 | |
| gtgcatatat atgtgagaat tttgctcaat ccagtagccc agaaagccaa accatttatc | 60 |
| tcttactgtt ctatcccaga gtctgacaac ctggattacc gcctaggagc tattcactcc | 120 |
| ctggtatata agctaccaga aaagaaccga gagatgctgg aacttctgat aagacacttg | 180 |
| gtcaagtaag taactgctgg attttcagaa aaagttccta ttagaggact ggcccatgtg | 240 |
| gttggtactac acagaaactg cctctcagct ctttcagccc cagcccttaa gtgcttcctt | 300 |
| ggaagctgaa tgctctgtga ggaaggctat tttgccttga cccatgtaca tatectctta | 360 |
| gagtcacatcat gcatgtggat tgtctca | 387 |

<210> 19
 <211> 460
 <212> DNA
 <213> Homo sapiens

<220>
 <221> exon 19
 <222> (79)..(238)
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<220>
<221> oligonucleotide
<222> (51)..(70)
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<222> (252)..(271)
<223>

<400> 19

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| aacagcacct aaaacagtct tggttgtaag gggatactgg agcaaatttt gttaatcttg | 60 |
| ccccctttct tctggcagtg tgtgtgagca cagcaaagag aatcttatga cccctccaa | 120 |
| catgggagta atctttgggc ccaccctgat gagagctcag gaggacactg tggccgcat | 180 |
| gatgaacatc aaattccaga acatagtggg ggaaatacta atcgagcact ttggcaagg | 240 |
| atgcattttc tattctcact acctgtcttc caaacatgtg acactttccc ccaactgcct | 300 |
| tttagtgctg tgtcttcctc cttggctcac gttgacagt aaaggaaatc ccattatgac | 360 |
| acaatgacat ttaatggcaa ctctgaccct gggaaattca ttcattcagc aaacattgct | 420 |
| taagcttata actatattat tttcagacac catgctaaat | 460 |

<210> 20
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<212> DNA
<213> Homo sapiens

<220>
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<223> n=(a or c or t or g)

<220>
<221> exon 20
<222> (230)..(377)
<223>

<220>
<221> oligonucleotide
<222> (206)..(225)
<223>

<220>
<221> oligonucleotide
<222> (383)..(402)
<223>

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| tcttcctaac tgagaagtgc caggttntgt gccttgagca tagtaggagn tacntaaaca | 60 |
| tttacctgta gntagagtga ttaagaaaat ctctgattct ttgagtcacg ttagtattca | 120 |
| cgtnacaaac tctagatata aggccaacaa gcatcaantg gtgggtagca ttcagaagac | 180 |
| aaaaanttga tntaantatt cntagatat nttccttctt tntccacaga tctatttagg | 240 |
| tccacctgag gaaagcgctg caccgccagt gcctccgcct cgggtgacag caagaaggca | 300 |
| caaaccaatc acgatttcaa agcgcttgct gcgagaaagg acggttttct atactttctc | 360 |
| cctggatgaa agcgaaggtc agtactnagg ttctccttta gcttctgaat ggtgattaga | 420 |
| cacnnagnan gatatcnaat ggctcaagcg gtggcatcac catttntctc tctataaaag | 480 |
| tanacctttc ctgntcctcg aacttaaaag ca | 512 |

<210> 21
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 <223> n=(a or c or t or g)

<220>
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 <222> (185)..(508)
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<220>
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 <222> (151)..(170)
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 <222> (511)..(530)
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| ggctttacat gaactgggaa gggtagagaa tgattttgtg ggatatagtt ggtttggtgcc | 60 |
| acagtgacat aactgctttg aaaatgtata caaattttca aaattaagta tgtatgcatg | 120 |
| tatcaaaatg aaaaggttttt aaaagttatc attaatcttc cctnttggca ccaacttttc | 180 |
| ctagatgaaa tccaacatca aacaccgaat ggtactatca ccagcagcat agaaccccc | 240 |
| aagccaccac aacaccccaa actacctatt cagaggagtg gggaaactga tcctgggagg | 300 |

| | |
|---|-----|
| aagtccecaa gcaggcctat tttggatggc aagttggagc cctgcccaga ggtggacgtg | 360 |
| gggaagttgg tgtctaggct gcaggatgga gggaccaaga tcaccccaaa ggccaccaat | 420 |
| ggacccatgc caggctctgg gccaccaag accccctctt tccacataaa gagaccagct | 480 |
| ccccggcccc tggcccacca caaggagggt aagtgccttg gaatcccatg ggagccagag | 540 |
| ctgaccctaa ctacttttca ccttgagatc cttctgagtt tggagatata tttaagtga | 600 |
| aatatgttcc agtttactac cactaatatt ggaacagtgg gcaagatcac aataatcagt | 660 |
| cacaataatc actagaatgt aagctccatg agggccggga ttttttaoct gttttgttga | 720 |
| cctctatata ccaagtgcta tgtgcctggc actgtactaa ttgctgatat actatttctt | 780 |
| atcctcacia tcccactgta aagaatgtat tattcttaat attttctttt tttttttttt | 840 |
| t | 841 |

<210> 22
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 <213> Homo sapiens

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 <223> n=(a or c or t or g)

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 <222> (320)..(485)
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 <222> (294)..(313)
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 <222> (496)..(515)
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| tttaatcctc ccactatctc tgtaagataa tatattgtgg atctttatta tataagctggg | 60 |
| gaaactgaga cttaggggaat ggatatgaca cacccaagat atntgaaact ccagagctgg | 120 |
| ggttcaaata tagactttct gaagggacag ttgccagaaa aattacaaaa aaaaaaaaaa | 180 |
| atagccagag ttgttagtca ccaagaagaa atggaggcca aggaagttgg cccaggtaac | 240 |
| tctcatattg ggtgcctgct catgagtagt gttctgtttg gctaaccatc caagttcctg | 300 |

| | |
|---|-----|
| gtatcatttt ctcttcagg ggatgctgac agtttcagca aagtgcggcc tccaggagaa | 360 |
| aagccaacca tcatccgccc ccagtgagg cccccagatc ctccctgccg ggcagctact | 420 |
| ccccaaaagc cagaaccaa gccagatatt gtggctggca atgcggggga aatcacatca | 480 |
| tctgtgtcag tagggttgta cctcaaagtt gactgaagtc ctgtactagg ccactaggaa | 540 |
| tgctttcagg atcaccatat taagggtata cagtgcacag ccctggggca tccttcactt | 600 |
| tatagtctag ggaaa | 615 |

<210> 23
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 <213> Homo sapiens

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 <221> exon 23
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 <223>

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 <222> (179)..(198)
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<220>
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 <222> (271)..(291)
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| acatttgtat gtgtagggcc ttgcccagca aaggcagggg ctggcattgg tgtcccatct | 120 |
| ggttcagagt ctctgtcct ttctgttggc cattggttct cacgtgtata ccaaagcaac | 180 |
| ttatgggact tggttggctt ctgtttgcag ggtggcttcc aggaccagggt tttttgaaac | 240 |
| agcttcccgg aaaacaggaa ggtaagatat ggaggtgaca aaagaaaaac caaatcgctt | 300 |
| tttaataact gcataccttag catacaattg tgctcactct aacatctttc tctttttggt | 360 |
| tctctacage tctgtctctg tctgtcactt tctcttcccc aattctgtct ctccatccct | 420 |
| atctgtctgt cacctgttca cctgtgtgtc tatttgtttc tctcatattc ttttt | 475 |

<210> 24
 <211> 238
 <212> DNA

<213> Homo sapiens

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<222> (115)..(156)

<223>

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<222> (65)..(84)

<223>

<220>

<221> oligonucleotide

<222> (165)..(184)

<223>

<400> 24

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| ccattttttca aatggcctct ttagcactgg cctagaagtg tcccccatc cccaattta | 60 |
| cctttccagt cctgatttct agaatcttag tgaaacgtct ttctttatcc acagttctca | 120 |
| aggcagactt cctggagatg aaagttgagg ctacaggtat gcagtcccca tccctgatta | 180 |
| caaaatcttg ttccacataa gccttcatta cgggatctga tattttgagg actggaat | 238 |

<210> 25

<211> 4504

<212> DNA

<213> Homo sapiens

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<222> (1)..(4235)

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<220>

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<222> (4236)..(4241)

<223>

<400> 25

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| aaacctttgt gtgcggagtc attttgtgtt gaagagcagc tccttcctag ccttgcaactt | 120 |
| tcagactctc tctgggaggc cataaaataa ggagcatatg tcctagacag gtgtttatat | 180 |
| ctcctttgta ttctgtcttc atcccctcag aaggtctgtt ttgagttcct ataacactgt | 240 |
| gaagagctgg actccctcaa gccagactct gccaaaacca agatatccac ttacctgagt | 300 |
| tgaagagggg agctcagttt tcaactcttc cctgaacttc ctgcttcctc agagggccat | 360 |

| | |
|--|------|
| tgaactctga gagatttggg gctaaagact gatctcaggg gtcttacctt gaactgaagg | 420 |
| ccacttgagt tggggccatt gcttaccttg gttggaaggg aatagaaatg tttgctgaac | 480 |
| attggagaat ctcaacatgt ctccactga ggatatggac actggtgcca tgtcagcgct | 540 |
| ctggtgctgc agtatgttg caagagcccg tctgctcctg cgaggctatg agtgggatga | 600 |
| gtgatgcccc cacagcacct ccatgtggac ttaggaaggt ggccttcctg ctgttacatg | 660 |
| cagccactta ggacaaatct gcaaagcatg ttttgcattg aaaagcctag gtctatttgg | 720 |
| attattcttt ctcccttttt ttgacagctt cctgtcaagc aatcaagaaa caaacaaaag | 780 |
| ctgaacacat ttccctttta aaaaaggaga ctgtgttttg tcctgtagga gttctatttt | 840 |
| ggggtcaaat gctagaaaaa ttgttaaggt ggattgaggc caggcagctg tcaactgctgc | 900 |
| ttcatgtttg ccttctgcac ataaactctt ttatctcctg aaaaaagcag ttcttaaccc | 960 |
| agtgtccatg gactcagaaa ctccatgatg cccctgagat ggtatgcaca attccatgac | 1020 |
| aatatgccct ttctggggag atagtccata atgttctgct aaatttcaaa tgggctcgtg | 1080 |
| acccaaaaaa gtcaagaacc acagcacttg agttaaata ctctttttac aatccatata | 1140 |
| agcccttgat tggaagggct tttcaaaatc atttagtcta acaactgcc agtttccagt | 1200 |
| cgggggaact gaggcagagc aaggtagtga tcacaccagt acaagatttc aggtcccagg | 1260 |
| ctcctatgca agtttttttt cccattata tcacacttat ttagcaaggg accttgtggt | 1320 |
| ttgtggcttt agtggccatc atttctgggg gttggctttt accctttttc ttgaatattt | 1380 |
| gccaccaagt gaaaaatgtt aggacataaa cccttgccag gtccctttca tttgctatct | 1440 |
| ctattattgg aaaggaccta aaaattggtg taatggggca gaaatctgag gaatggacat | 1500 |
| ttctaattcc tgtttggtga agggaagttg ctggaaagag catcagtact tgtttctatg | 1560 |
| cagatgcctg ggccgtagct tgtctgtagc gtctgtataa ttataatgtt gccagtggtg | 1620 |
| agggaaagag ctttcctact tgcactcttc taccaaggcc ctgttagtgc actgattata | 1680 |
| gtactgacag ataaagccta gatgagagag atagagagtg agtacatgca cactcatgtg | 1740 |
| caaaccact cagagatgca tttggaacag tgctactgaa aggcagtagt cattttcaag | 1800 |
| actgaattcc aaacatggtt tattggtgag ttaggaacat gtaaggccaa gtacactgag | 1860 |
| agcctttttg aaagtaattg agtggaact tgatgccatt ctaaatacaag gcataatccag | 1920 |
| gtggcccggt ttgaactcac tccactgtac ccagtctcaa aggccagggt gctaagaaac | 1980 |
| caggagtaaa agagtcaagt gaccatcatt tcacctgctg cttgccccca atagtagtct | 2040 |
| ctgtgaggcc ttactgacct cacctaggaa gtgatttttg agcccttggt tcagggtgtg | 2100 |

| | |
|--|------|
| ggcctccctg ctctatcctg aataaagcag acaggtgtgc agattttggc catgaaagca | 2160 |
| tggctaatag ggccacagtc cctttaaaga aacatggttt gactctgggtt ttcttggggg | 2220 |
| aaaataccac aatcacccgat gcaaacattg gaagattatt gagagcccta gaaagctgct | 2280 |
| gtgatcccag tagaaaatat gtcccagaaa tgtcatgaga ttgctgtgtg ttgcctggga | 2340 |
| cacagatcaa gggcctatct tggagagctg gggaccagca gtctgcctgg aggccaggga | 2400 |
| gcagtggctg agtagctctg cctttgctct ggtctatacc ttaagaatgc caaagaatga | 2460 |
| atttcaacgc ctgccttttg cactctgact taaagtgcaa aaagcttctg tggcgaggca | 2520 |
| tgctatcatg gaatgagact ggcttgcctt aggccttaatg gatgggcagt cattttgcag | 2580 |
| aggctatggg aagaggggtga taatagaaga gtggcagcta taggaaatta tcaacatacc | 2640 |
| ttggccagca agttagagaa tctggcaatg gatgaactga aagtgatgaa ctggcaggga | 2700 |
| taacaaagaa cctaacattt attaagcacg tatttattaa ctgctcagtg tttcatattc | 2760 |
| atgcaagtat tctcatttta cagagaaaga aattatggcc cagggggcta aagtaaacaa | 2820 |
| ctcaagggca catagaaagt aaataaaagg actgtgattt gaatccaggc cactcttagc | 2880 |
| ccatgctggt ttccctttgc cacactgtgg taggtgtttg aacagaggcc acattactag | 2940 |
| agttggcatg actcttgact cttgcctgcc taacaaaata ttgaaaggca aacatttgaa | 3000 |
| ggagggaggg ggtgcagggt cagtttatat ggaaatgcaa actgggctgg aagatattcc | 3060 |
| tgagttaggc tttctcttca tattcagctt gcacatttg taatgttttt aaaatgatca | 3120 |
| tctaatttta ttttgtgaag tgaaggattt gtgttttagt tggcagttgt taagtccttg | 3180 |
| gcttgccatt tttcaaaaag taaaaaggtc ctcacagggt tctccatact tcgccaagg | 3240 |
| tgtagcatgg gcagtttcag tttcagccta agagactggg gacatccaca aatgcagttt | 3300 |
| tagaagcaga aaaggctctg gtgcctctgc agtacttgat gtattggggg caaatctcta | 3360 |
| caaatttttc tgtggtgata gcaaaatcaa gagatggctt acaaaaagaa atattgaatt | 3420 |
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| acttagcatc taatttcaat tatagtgtca tgcagagtat ttctaaagta attggttata | 3540 |
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| gtagtaaaaag aagaaatagt tctgtgacta ggaaaaaatt gcttttgaga gaacatagat | 3660 |
| caattatact acttctaagg tagctgcaga taagtggcct tgacacatta caagcctgga | 3720 |
| aaaaaacatc agaaataata aaaaatttca gagagaatca agataccttt ttttttcttt | 3780 |

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| aatttcatcc atgtccctac aaaggatatg aactcatcat tttttatggc tgcatagtat | 4140 |
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<400> 27

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| Met | Gly | His | Pro | Pro | Leu | Glu | Phe | Ser | Asp | Cys | Tyr | Leu | Asp | Ser | Pro |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |

Asp Phe Arg Glu Arg Leu Lys Cys Tyr Glu Gln Glu Leu Glu Arg Thr
20 25 30

Asn Lys Phe Ile Lys Asp Val Ile Lys Asp Gly Asn Ala Leu Ile Ser
35 40 45

Ala Met Arg Asn Tyr Ser Ser Ala Val Gln Lys Phe Ser Gln Thr Leu
50 55 60

Gln Ser Phe Gln Phe Asp Phe Ile Gly Asp Thr Leu Thr Asp Asp Glu
65 70 75 80

Ile Asn Ile Ala Glu Ser Phe Lys Glu Phe Ala Glu Leu Leu Asn Glu
85 90 95

Val Glu Asn Glu Arg Met Met Met Val His Asn Ala Ser Asp Leu Leu
100 105 110

Ile Lys Pro Leu Glu Asn Phe Arg Lys Glu Gln Ile Gly Phe Thr Lys
115 120 125

Glu Arg Lys Lys Lys Phe Glu Leu Asp Gly Glu Arg Phe Tyr Ser Leu
130 135 140

Leu Asp Arg His Leu His Leu Ser Ser Lys Lys Lys Glu Ser Gln Leu
145 150 155 160

Gln Glu Ala Asp Leu Gln Val Asp Lys Glu Arg His Asn Phe Phe Glu
165 170 175

Ser Ser Leu Asp Tyr Val Tyr Gln Ile Gln Glu Val Gln Glu Ser Lys
180 185 190

Lys Phe Asn Ile Val Glu Pro Val Leu Ala Phe Leu His Ser Leu Phe
195 200 205

Ile Ser Asn Ser Leu Thr Val Glu Leu Thr Gln Asp Phe Leu Pro Tyr
210 215 220

Lys Gln Gln Leu Gln Leu Ser Leu Gln Asn Thr Arg Asn His Pro Ser
225 230 235 240

Ser Thr Arg Glu Glu Met Glu Glu Leu Lys Lys Arg Met Lys Glu Ala
245 250 255

Pro Gln Thr Cys Lys Leu Pro Gly Gln Pro Thr Ile Glu Gly Tyr Leu
260 265 270

Tyr Thr Gln Glu Lys Trp Ala Leu Gly Ile Ser Trp Val Lys Tyr Tyr
275 280 285

Cys Gln Tyr Glu Lys Trp Thr Lys Thr Leu Thr Met Thr Pro Met Glu
290 295 300

Gln Lys Pro Gly Ala Leu Gln Gly Pro Leu Asp Leu Thr Leu Lys Tyr
305 310 315 320

Cys Val Arg Arg Lys Thr Glu Ser Ile Asp Lys Arg Phe Cys Phe Asp
325 330 335

Ile Glu Thr Asn Glu Arg Pro Gly Thr Ile Thr Leu Gln Ala Leu Ser
340 345 350

Glu Ala Asn Arg Arg Leu Trp Met Glu Ala Met Asp Gly Lys Glu Pro
355 360 365

Ile Tyr His Ser Pro Ile Thr Lys Gln Gln Glu Met Glu Leu Asn Glu
370 375 380

Val Gly Phe Lys Phe Val Arg Lys Cys Ile Asn Ile Ile Glu Thr Lys
385 390 395 400

Gly Ile Lys Thr Glu Gly Leu Tyr Arg Thr Val Gly Ser Asn Ile Gln
405 410 415

Val Gln Lys Leu Leu Asn Ala Phe Phe Asp Pro Lys Cys Pro Gly Asp
420 425 430

Val Asp Phe His Asn Ser Asp Trp Asp Ile Lys Thr Ile Thr Ser Ser
435 440 445

Leu Lys Phe Tyr Leu Arg Asn Leu Ser Glu Pro Val Met Thr Tyr Arg
450 455 460

Leu His Lys Glu Leu Val Ser Ala Ala Lys Ser Asp Asn Leu Asp Tyr

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 465 | | 470 | | 475 | | 480 | | | | | | | | | |
| Arg | Leu | Gly | Ala | Ile | His | Ser | Leu | Val | Tyr | Lys | Leu | Pro | Glu | Lys | Asn |
| | | | 485 | | | | | | 490 | | | | | 495 | |
| Arg | Glu | Met | Leu | Glu | Leu | Leu | Ile | Arg | His | Leu | Val | Asn | Val | Cys | Glu |
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| His | Ser | Lys | Glu | Asn | Leu | Met | Thr | Pro | Ser | Asn | Met | Gly | Val | Ile | Phe |
| | | 515 | | | | | 520 | | | | | 525 | | | |
| Gly | Pro | Thr | Leu | Met | Arg | Ala | Gln | Glu | Asp | Thr | Val | Ala | Ala | Met | Met |
| | 530 | | | | | 535 | | | | | 540 | | | | |
| Asn | Ile | Lys | Phe | Gln | Asn | Ile | Val | Val | Glu | Ile | Leu | Ile | Glu | His | Phe |
| 545 | | | | | 550 | | | | | 555 | | | | | 560 |
| Gly | Lys | Ile | Tyr | Leu | Gly | Pro | Pro | Glu | Glu | Ser | Ala | Ala | Pro | Pro | Val |
| | | | | 565 | | | | | 570 | | | | | | 575 |
| Pro | Pro | Pro | Arg | Val | Thr | Ala | Arg | Arg | His | Lys | Pro | Ile | Thr | Ile | Ser |
| | | | 580 | | | | | 585 | | | | | 590 | | |
| Lys | Arg | Leu | Leu | Arg | Glu | Arg | Thr | Val | Phe | Tyr | Thr | Ser | Ser | Leu | Asp |
| | | | 595 | | | | | 600 | | | | 605 | | | |
| Glu | Ser | Glu | Asp | Glu | Ile | Gln | His | Gln | Thr | Pro | Asn | Gly | Thr | Ile | Thr |
| | 610 | | | | | 615 | | | | | 620 | | | | |
| Ser | Ser | Ile | Glu | Pro | Pro | Lys | Pro | Pro | Gln | His | Pro | Lys | Leu | Pro | Ile |
| 625 | | | | | 630 | | | | | 635 | | | | | 640 |
| Gln | Arg | Ser | Gly | Glu | Thr | Asp | Pro | Gly | Arg | Lys | Ser | Pro | Ser | Arg | Pro |
| | | | | 645 | | | | | 650 | | | | | 655 | |
| Ile | Leu | Asp | Gly | Lys | Leu | Glu | Pro | Cys | Pro | Glu | Val | Asp | Val | Gly | Lys |
| | | | 660 | | | | | 665 | | | | | 670 | | |
| Leu | Val | Ser | Arg | Leu | Gln | Asp | Gly | Gly | Thr | Lys | Ile | Thr | Pro | Lys | Ala |
| | | | 675 | | | | 680 | | | | | 685 | | | |
| Thr | Asn | Gly | Pro | Met | Pro | Gly | Ser | Gly | Pro | Thr | Lys | Thr | Pro | Ser | Phe |
| | | | 690 | | | 695 | | | | | 700 | | | | |

His Ile Lys Arg Pro Ala Pro Arg Pro Leu Ala His His Leu Glu Gly
705 710 715 720

Asp Ala Asp Ser Phe Ser Lys Val Arg Pro Pro Gly Glu Lys Pro Thr
725 730 735

Ile Ile Arg Pro Pro Val Arg Pro Pro Asp Pro Pro Cys Arg Ala Ala
740 745 750

Thr Pro Gln Lys Pro Glu Pro Lys Pro Asp Ile Val Ala Gly Asn Ala
755 760 765

Gly Glu Ile Thr Ser Ser Val Val Ala Ser Arg Thr Arg Phe Phe Glu
770 775 780

Thr Ala Ser Arg Lys Thr Gly Ser Ser Gln Gly Arg Leu Pro Gly Asp
785 790 795 800

Glu Ser